4WD-RCRA

SUBJ: Evaluation of Cavenham Forest Industry's status under the RCRIS Corrective Action Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. Number: MSD 057 226 961

FROM: Lael Butler
AL/MS Unit

THRU: Rich Campbell, Chief
AL/MS Unit

Kent Williams, Acting Chief
RCRA Permitting Section

TO: G. Alan Farmer
Chief, RCRA Branch

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of the Cavenham Forest Industry's Gulfport, Mississippi facility status in relation to the following RCRIS corrective action codes:

1) Human Exposures Controlled Determination (CA725),

2) Groundwater Releases Controlled Determination (CA750).

The applicability of these event codes adheres to the definitions and guidance provided by the Office of Solid Waste (OSW) in the July 29, 1994, memorandum to the Regional Waste Management Division Directors.

Concurrence by the RCRA Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing above.

II. HUMAN EXPOSURES CONTROLLED DETERMINATION (CA725)

There are three (3) national status codes under CA725. These status codes are:

1) YE Yes, applicable as of this date.

2) NA Previous determination no longer applicable as of this data.

3) NC No control measures necessary.

Region 4 has added a regional status code to CA725 which tracks initial evaluations in which a determination is made that plausible human exposures to current contamination risks are not controlled. This regional status code is listed as "NO, not applicable as of this date." Use of the regional status code is only applicable during the first CA725 evaluation. Evaluations subsequent to the first evaluation will use the national status codes (i.e., YE, NA and NC) to explain the current status of exposure controls.

Note that the three national status codes for CA725 are based on the entire facility (i.e., the codes are not SWMU specific). Therefore, every area at the facility must meet the definition before a YE, NA or NC status code can be entered for CA725. Similarly, the regional status code, NO, is applicable if plausible human exposures are not controlled in any areas of the facility.

This particular CA725 evaluation is the **first evaluation** performed by EPA for the Cavenham facility. Because assumptions have to be made as to whether or not human exposures to current media contamination are plausible and, if plausible, whether or

not controls are in place to address these plausible exposures, this memo first examines each environmental media (i.e., soil, groundwater, surface water, air) at the entire facility including any offsite contamination emanating from the facility rather than from individual areas or releases. After this independent media by media examination is presented, a final recommendation is offered as to the proper CA725 status code.

The following discussions, interpretations and conclusions on contamination and exposures at the facility are based on the following reference documents:

- RFI Report, 11/16/92;
- CMS Work Plan, 11/16/92; &
- CMS Progress Report, 9/15/95.

III. MEDIA BY MEDIA DISCUSSION OF CONTAMINATION AND THE STATUS OF PLAUSIBLE HUMAN EXPOSURES

Groundwater

Releases have contaminated groundwater with phenolic and base/neutrals constituents associated with the creosote and pentachlorophenol wood treating process. However, production activities ceased, the units have been closed according to approved closure plans, physical access is restricted, and there is an extensive corrective action system in place..

The groundwater remediation system consists of these components:

- soil-bentonite cutoff walls,
- (22) groundwater recovery wells,
- on-site treatment system, and an
- extensive network of groundwater monitor wells.

Since startup of the system in January, 1991, over 14.9 million gallons of contaminated groundwater has been recovered. Approximately 200,000 gallons of nonaqueous phase liquid (NAPL) was recovered and shipped off-site for reclamation/disposal.

Approximately 3.0 million gallons of groundwater were treated and returned to the aquifer system and approximately 17.0 million gallons of groundwater were treated and discharged via NPDES.

There are approximately seventy-seven (77) water supply wells within a one-mile radius of the facility. However, these wells are outside the known limits of groundwater contamination which is confined on-site. Specifically, city water is available to all residents within a one-mile radius of the site.

On-site there is one water supply well which was installed during the 1930's. The water intake is approximately 800 feet below ground surface. From time to time, CFI withdraws water to clean components of the treatment system such as the carbon filters. Samples for investigation and monitoring purposes have not detected contamination and are not routinely collected. The water well is physically located within the former hazardous waste management area which is surrounded by the subsurface soil-bentonite slurry wall and above ground is fenced.

In the stratified subsurface sediment, there was limited vertical migration of NAPL constituents. Cavenham submitted a Revised Corrective Action Plan (May 5, 1995) proposal to add fourteen injection wells and enhance shallow "flushing", six groundwater reinfiltration trenches to encourage the in situ biodegradation by resident microorganisms, and seventy-six air sparging well points to provide aeration for biodegration. These efforts are designed to provide a more effective system for the remediation of the groundwater plume.

Contaminants found in the groundwater at this site have not been detected in samples of the two water bodies (Harrison County Industrial Seaway and Turkey Creek) that have been identified as potential pathways. Off-site human exposure to contaminated groundwater is possible only if contaminants were detected in these adjacent surface water bodies. Therefore, while the groundwater is contaminated, there is no plausible on-site or off-site human exposure to contaminated groundwater emanating into surface water.

Surface Water

The Harrison County Industrial Seaway and Turkey Creek are both adjacent to the Cavenham facility. Surface water samples from both these water bodies have been collected and analyzed during the RCRA facility investigations. The results from the investigations did not indicate any surface water impacts.

The northeastern portion of the site is bounded by the Seaway. The process units which could have impacted the surface water were physically removed, the contaminated soil was excavated then placed in an on-site landfill, and then a soil-bentonite physical barrier was installed to prevent movement of groundwater contaminant plumes. Also, there is a gradient control network of wells within the soil-bentonite barrier wall which produces an inward flow gradient.

The surface water is not contaminated. Because there is no evidence of surface water contamination, there are no plausible human exposures which need to be controlled.

Soil

When Cavenham closed the facility, the former process units were excavated and consolidated into a hazardous waste landfill in accordance with an approved closure plan. As discussed above, a soil-bentonite slurry wall, recovery wells, and monitoring wells were installed to retard groundwater movement and provide assessment of remedial efforts.

On-site exposure to contaminated soil is possible only during the installation of additional groundwater wells, etc. However, there is an established personnel protection and safety protocol which is followed during all field activities. Off-site exposure to contaminated soil is not possible as there are no observed off-site releases to soil.

Air

Releases to air from soil, groundwater and/or surface water at Cavenham is not known or expected to be occurring above relevant action levels.

IV. STATUS CODE RECOMMENDATION FOR CA725:

Based upon facility investigations performed pursuant the State of Mississippi's Post-Closure portion and the federal HSWA portion of the RCRA Permit, remedial measures have been implemented and appear successful in controlling plausible human exposures in all applicable media. Because human exposures to contamination are controlled at the Cavenham facility, it is recommended that **CA725 YE** be entered into RCRIS (see attached form).

V. GROUNDWATER RELEASES CONTROLLED DETERMINATION (CA750)

There are three (3) status codes listed under CA750:

1) YE Yes, applicable as of this date.

2) NA Previous determination no longer applicable as of this date.

3) NR No releases to groundwater.

Region 4 has also added an additional status code which tracks the initial evaluations in which a determination is made that groundwater releases are not controlled. This regional status code is listed as "NO, not applicable as of this date." Use of the regional status code is only applicable in the first CA750 evaluation. Evaluations subsequent to the first evaluation will use the national status codes (i.e., YE, NA and NR) to explain the current status of groundwater control.

Note that the three national status codes for CA750 are designed to measure the adequacy of actively or passively

controlling the physical movement of groundwater contaminated with hazardous constituents above relevant action levels. The point where the success or failure of controlling the migration of hazardous constituents is measured is termed the designated boundary (e.g., the facility boundary, a line upgradient of receptors, the leading edge of the plume as defined by levels above action levels or cleanup standards, etc.). Therefore, every contaminated area at the facility must meet the definition before these event/status codes can be entered. Similarly, the regional status code is applicable if contaminated groundwater is not controlled in any area(s) of the facility.

This evaluation for CA750 is the first formal evaluation performed for this facility. Please note that CA750 is based on the adequate control of **all** contaminated groundwater at the facility.

The following discussions, interpretations and conclusions on contaminated groundwater at the facility are based on the reference documents cited in Section II of this memorandum.

VI. STATUS CODE RECOMMENDATION FOR CA750:

The stratification of the various subsurface soil horizons encountered at the site, in depth descending order, are defined by "horizons":

N Horizon 1 (H1) is composed of clayey and silty topsoil and/or fill material which ranges in thickness from 2 - 5 feet.

N Horizon 2 (H2) is silty clay to clayey silt, and occasionally sandy clay. Thickness varies from . 2 - 37 feet.

N Horizon 3 (H3) is sand to silty sand and appears to be present as a continuous unit across the site. The thickness varies from . 2 - 35 feet. **This horizon represents the uppermost water bearing zone.** The hydraulic conductivity varies considerably, however, the average is . 2.3 ft/day.

The majority of the monitor wells, and all recovery and injection wells at the site are screened in this horizon.

- Horizon 4 (H4) is predominantly an olive green marine clay layer with thin, lenticular silt-sand deposits and brown to dark gray, organic rich soils. It forms an **aquitard** between H3 and the deeper aquifers. The top of H4 represents a disconformable (erosional) surface. The thickness of this unit may be as much as 80 - 90 feet.

- Horizon 5 (H5) is the second water bearing zone. It appears to be a local sand unit within the H4 marine clay unit.

- "100-Foot Sand" is an artesian aquifer whose top is encountered . 100 feet below land surface.

Extensive soil boring, well installation and corrective action programs have produced a comprehensive geological, hydrological, and water quality data base. The results indicate the existence of two principal subsurface contamination plumes in the form of : (1) NAPL comprised of polynuclear aromatic hydrocarbons (PAH) and phenols, and (2) dissolved PAH and phenolic compounds. The primary source of the subsurface contamination is believed to be the a buried process unit (Vacuum Pond), the location of which was discovered during the remedial investigations.

Over the eighty year period since plant operations began, the dissolved portion of the contaminant plume has migrated at an estimated rate of 5.7 ft/year. The direction of plume migration has been along groundwater flow lines. The observed rate of soluble contaminant migration agrees well with observed groundwater velocities of between 40 ft/year and 80 ft/year. Reduction of the groundwater mounding, achieved by the solidification and capping of sources of recharge, along with cutoff wall installation, recovery and treatment operations have further reduced the rate of migration, and within the cutoff wall bounds, stopped it.

As discussed above, the groundwater is contaminated by releases from former process units and other activities which

occurred during the operating life of the facility. In addition to the observed groundwater contamination, there are specific control measures present. The measures control the physical migration beyond the designated facility boundary. CFI routinely reviews the effectiveness of their current recovery and treatment system and looks to update using innovative technology for enhancement. It is recommended that **CA750 YE** be entered into RCRIS (attachment).

Attachments